

Stat 341 Lecture 3

Brad McNeney

2017-01-18

Control Flow

Reading from and writing to files

Control Flow

if and if-else

- ▶ if tests a condition and executes code if the condition is true. Optionally, can couple with an else to specify code to execute when condition is false.

```
if("cat" == "dog") {  
  print("cat is dog")  
} else {  
  print("cat is not dog")  
}
```

```
## [1] "cat is not dog"
```

for loops

Example:

```
n <- 10; nreps <- 100; x <- vector(mode="numeric",length=nreps)
for(i in 1:nreps) {
  # Code you want to repeat nreps times
  x[i] <- mean(rnorm(n))
}
summary(x)
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.641500 -0.215000  0.003945  0.009429  0.254000  0.644700
```

```
print(i)
```

```
## [1] 100
```

for loop index set

- ▶ Index sets of the form 1:n are most common, but can be almost any atomic vector.

```
ind <- c("cat", "dog", "mouse")
for(i in ind) {
  print(paste("There is a", i, "in my house"))
}
```

```
## [1] "There is a cat in my house"
## [1] "There is a dog in my house"
## [1] "There is a mouse in my house"
```

while loops

- Use a while loop when you want to continue until some logical condition is met.

```
set.seed(1)
# Number of coin tosses until first success (geometric distn)
p <- 0.1; counter <- 0; success <- FALSE
while(!success) {
  success <- as.logical(rbinom(n=1,size=1,prob=p))
  counter <- counter + 1
}
counter
```

```
## [1] 4
```

break

- break can be used to break out of a for or while loop.

```
for(i in 1:100) {  
  if(i>3) break  
  print(i)  
}
```

```
## [1] 1
```

```
## [1] 2
```

```
## [1] 3
```


Reading from and writing to files

Native format

- ▶ Use `save()` to save R objects to an “R Data” file.
 - ▶ `save.image()` is short-hand to save all objects in the workspace

```
x <- rnorm(100); y <- list(a=1,x=x)
save(x,y,file="test.RData") # Or .rda, or ...
```

- ▶ Load R Data files into the workspace with `load()`.

```
load("test.RData")
file.remove("test.RData")
```

```
## [1] TRUE
```

Table format files

- ▶ `read.table()` is the main function for reading tabular data from plain-text files.
 - ▶ `read.csv()` and `read.delim()` are basically `read.table()` with defaults for reading comma- and tab- delimited files.
- ▶ `write.table()`, `write.csv()` and `write.delim()` are the analogous functions for writing tabular data

```
write.table(matrix(1:9,3,3),file="test.txt")
test <- read.table("test.txt")
file.remove("test.txt")
```

```
## [1] TRUE
```

```
test
```

```
##    V1 V2 V3
## 1   1  4  7
## 2   2  5  8
## 3   3  6  9
```

Reading files from a URL

- ▶ `load()`, `read.table()`, etc. can read data from a URL.

```
baseURL <- "http://people.stat.sfu.ca/~mcneney/Teaching/Stat341/"  
rdURL <- url(paste0(baseURL, "Data/PorschePrice.rda"))  
load(rdURL)  
head(PorschePrice)
```

```
##   Price Age Mileage  
## 1  69.4   3   21.5  
## 2  56.9   3   43.0  
## 3  49.9   2   19.9  
## 4  47.4   4   36.0  
## 5  42.9   4   44.0  
## 6  36.9   6   49.8
```

```
csvURL <- url(paste0(baseURL, "Data/PorschePrice.csv"))  
PorschePrice <- read.csv(csvURL)
```